



**California Center for Population Research**  
**University of California - Los Angeles**

# **SPOUSAL MIGRATION AND LATER-LIFE HEALTH FOR OLDER MEXICAN WOMEN**

Jacqueline M. Torres

**PWP-CCPR-2013-013**

**Last revised: January 1, 2014**

***California Center for Population Research  
On-Line Working Paper Series***

**Jacqueline M. Torres**  
**University of California, Los Angeles**  
**Version: January 2014**

**Working Paper:**  
**SPOUSAL MIGRATION AND LATER-LIFE HEALTH FOR OLDER MEXICAN**  
**WOMEN**

**NOTE: This paper has not yet been peer reviewed. Please do not copy or cite without permission from the author(s).**

***ABSTRACT***

This article expands on the extant literature related to the effects of family member migration to the US on the health of women in Mexico with a focus on long-term effects of spouses' migration to the US on the hypertension, diabetes, and depression outcomes for a nationally representative sample of Mexican women 50 years and older who report ever being married or in a consensual union (n=6253). The results suggest that there are no significant differences in the later-life health outcomes for women with and without a history of spousal migration to the US if those women are currently in a union with their spouse. Women who report spousal migration and are not currently in a union (i.e. divorced, separated, or widowed) have significantly greater odds of doctor-diagnosed diabetes (OR: 1.58,  $p < 0.01$ ) and hypertension (OR: 1.38,  $p < 0.05$ ) later in life compared to women not currently in a union and with no spousal migration to the US. These results are robust to controls for aspects of marital and family history (e.g. total years married, number of live births). These significant results of spousal migration to the US on the diabetes and hypertension outcomes for non-married women did not appear to be mediated by the strain of raising children alone. There were significant interaction effects by women's own labor and migration history, and current decision-making power. There were no significant effects of spousal migration to the US on an indicator of past-week depression. The results speak to the importance of family migration history in shaping later-life chronic disease outcomes for older women in Mexico, in combination with their marital histories. These results underscore the importance of US migration as a social determinant of health for an aging Mexican population.

## ***INTRODUCTION***

Mexico is currently undergoing a rapid demographic and epidemiologic transition with consequences for health and well-being. For one, longer life expectancy in combination with declining fertility rates have led to a quickly aging Mexican population (Ham-Chande, 2011). Adults 60 years and older are expected to rise from 6% of the Mexican population in 2000 to 15% in 2027. In contrast, this is half the time that it took U.S. and Japan to undergo the same shift in age structure (R. Wong & Palloni, 2009).

Meanwhile, the epidemiological transition has led to the rise of non-communicable diseases as leading causes of morbidity and mortality in Mexico. Between 1970 and 1990, mortality due to infectious disease fell from 7.7 per 1000 to 0.75 per 1000 while chronic or degenerative disease mortality rose from 1.04 to 2.15 per 1000 population in the same time period (R. Wong & Palloni, 2009). The leading causes of mortality in Mexico are now heart disease, diabetes, and cerebrovascular disease, and major depressive disorder is the largest contributor to disability (Stevens et al., 2008).

Within this shifting demographic and health context, there is an increasing interest in the life-course social determinants of health for older adults in Mexico. Unlike infectious diseases, which are mostly influenced by proximal causes such as current hygiene and nutritional status, chronic conditions are additionally influenced by a number of cumulative and latent factors over the life course. Even as medical and public health interventions have reduced acute illnesses, many older adults in Mexico experienced conditions of material deprivation and poor health in childhood as well as in mid-life, which may contribute to worse health in older ages. (Palloni, 1981). The long-term effects of these earlier life exposures are of increased interest to

researchers in Latin American health and aging, particularly in a context of persistent economic inequality and unequal social protection for older adults (R. Wong & Palloni, 2009).

Another important consideration when considering the social determinants of health in Mexico is the role of U.S. migration. Over the course of the 20<sup>th</sup> century, Mexico became the largest migrant sending country to the U.S. While Mexican immigrants increasingly settled in the U.S. towards the end of the 20<sup>th</sup> century, many earlier migrants returned to their communities in Mexico as temporary or ‘circular’ labor migrants (Durand, Massey, & Zenteno, 2001). There is growing evidence of the health influences of U.S. migration on those who remain in Mexico (Bojorquez, Salgado de Snyder, & Casique, 2009; Creighton, Goldman, Teruel, & Rubalcava, 2011; Ullmann, 2012). For example, the stress associated with family separation, feared or actual family dissolution, and increased responsibility for the well-being of young children has been linked to more depressive symptoms for Mexican women whose spouses have migrated to the U.S. (Bojorquez et al., 2009; Salgado de Snyder, 1993). Family members of U.S. migrants may also benefit from socio-economic mobility, better access to quality health care, as well as potentially adverse consequences of increased access to purchased foods or tobacco products (Handley et al., 2013; Riosmena, Frank, Akresh, & Kroeger, 2012; Salinas, 2008). Little is known, however, about how family member migration influences long-term chronic disease and mental health outcomes for older Mexican adults. In addition, explanatory and moderating influences on this relationship between U.S. migration history and later-life health of return migrants and their family members have seldom been reported. The objective of this chapter is to describe the relationship between spousal migration and later-life health outcomes for middle-aged and older Mexican women.

### ***Literature Review***

The literature on the health effects of spousal migration has primarily focused on mental health outcomes using qualitative data (McGuire & Martin, 2007) or quantitative data with community or regional samples (Bojorquez et al., 2009; Salgado de Snyder, 1993). These studies suggest that the stress associated with familial separation and the additional roles and responsibilities assumed by women who remain in countries of origin can lead to depression, anxiety, or *ataques de nervios* (Bojorquez et al., 2009; Salgado de Snyder, 1993). For example, in ethnographic work with women in Oaxaca, Mexico, McGuire and Martin (2007) report that many women with spouses in the U.S. expressed a sense of grief or loss during the time their spouse was away, often as part of real or perceived concerns of family disintegration. This sense of loss was compounded by feelings of uncertainty or fear around the safety of their family members while crossing the border and living in the U.S., particularly if they were undocumented. In addition, women who remain in communities of origin face additional roles as the result of their spouses' migration, including the potentially dual responsibilities of raising children and providing economically for the family, at least during periods in which spouses are not sending remittances back home (Salgado de Snyder, 1993).<sup>1</sup>

There may also be positive mental and physical health consequences of spousal migration on mental health, related to actual or expected improvements in the household economic situation or children's educational prospects due to migration (McGuire & Martin, 2007), or the

---

<sup>1</sup> Another study (Caballero, Levy-Flores, Ochoa-Marín, Zarco, & Guerrero, 2008) based in-depth interviews with women in two Central Mexican communities report that in the absence of sufficient remittances, women who remain often take on domestic or informal work in addition to their roles as heads of household and work inside the home. That is, women working outside the home might be indicative of insufficient remittances or general economic strain in the family. On the other hand, in their analysis of Mexican Migration Project data, Aysa and Massey (2004) found that only urban-dwelling women with migrant spouses in the U.S. were compelled to join the labor force; spousal migration did not appear to influence the labor participation of women who remained in rural areas of Mexico.

potential for women's increased autonomy around personal and family economic and health-related decisions. For example, Caballero and authors (2008) found in ethnographic work that some women with spouses abroad gained greater freedom to seek out health care services, particularly related to sexual and reproductive health. However, this increased autonomy around healthcare services was only enjoyed by women who did not move in with other family members during their spouses' time in the U.S.; while these women who remained on their own may have had less social support, they had greater autonomy. On the other hand, Bojorquez and authors (2009) found no support for the idea of increased autonomy, including autonomy in family decision-making and economic autonomy among community samples of Mexican women in the states of Guerrero, Oaxaca, and Puebla, and no significant interaction between spousal migration and autonomy measures on past-week depressive symptoms.

Ullmann (2012) has extended this literature on the relationship between spousal migration to the U.S. and chronic disease outcomes in her analysis of health differences for young and middle-aged adult women in Western Mexico based on their spouses' history of U.S. migration. Ullmann found mixed evidence for differential chronic health outcomes among women with migrant and non-migrant husbands. Those who had spouses with U.S. migration history were more likely to report heart disease, but there were no significant differences in hypertension, diabetes, or the odds of ever smoking when comparing women with migrant spouses and those with never-migrant spouses. In line with the literature on mental health outcomes, Ullmann also found evidence that women with spouses abroad were more likely to report "emotional or psychological" problems more generally, although with no clarification on the specific kind of problems these might be. There was no 'dose-response' effect of male

migration whereby women whose husband's spent a greater proportion of the total time of their union abroad had worse health.<sup>2</sup>

My analysis will build on the extant literature, which has addressed the effect of spousal migration on the health of Mexican women in younger adulthood or middle age, and has largely been restricted to community or regional samples and to mental health outcomes. Specifically, I will estimate the relationship between spousal migration and later-life hypertension, diabetes, and depression outcomes for a nationally representative sample of middle-aged and older Mexican women. I will additionally estimate the experience of raising children alone as a potential mediator explaining the relationship between spousal migration and health. Finally, I will examine aspects of women's labor, decision-making, and personal migration experiences that may moderate the relationship between spousal migration and later-life health for this sample of older Mexican women.

### ***Conceptual Framework and Hypotheses***

The theoretical motivation behind this analysis draws from work on transnationalism and gendered geographies of power. Transnationalism refers to the “political, economic, social and cultural processes that extend beyond the borders of a particular state, include actors that are not states, but are shaped by the policies and institutional practices of states” (Glick-Schiller, 1999).

Of specific relevance to my dissertation is the idea that families may extend temporarily or

---

<sup>2</sup> Ullmann also considered the possibility that women with migrant spouses were somehow differently selected into such unions based on their earlier life health conditions, as measured by a retrospective indicator of self-rated health status by 14 years old and adult height – a commonly used proxy of early childhood nutrition and health context. Although she found no differences on these two proxies of childhood conditions for women based on spousal migration histories, tests of other measures of childhood context (e.g. material deprivation, parental education, place of birth) and the role of women's broader family migration histories (e.g. among siblings, parents, or children) might be included in further examination of how spousal migration contributes to health and aging amidst other life-course contributors.

permanently across nation-state borders. Family members across borders may be engaged in economic exchanges, cultural practices, and social relationships that include caregiving, social support, and compliance with familial obligations (McKenzie & Menjívar, 2011; Viruell-Fuentes & Schulz, 2009). Shifts in lifestyle or dietary preferences, changes in family level purchasing power, and resources around chronic disease prevention and management as the result of migration to the U.S. might extend to family members, including those who never migrate, through economic or social remittances (Creighton et al., 2011; Riosmena et al., 2012). In addition, family separation across borders can very often involve experiences related to actual or potential family dissolution and feelings of worry and grief (Frank & Wildsmith, 2005; McGuire & Martin, 2007). These family strains over time may contribute to chronic stress burden, which may potentially elevate the risk of depressive symptoms, hypertension, and diabetes.

Attention to cross-border family ties and later-life health also needs to take into consideration the role of gender and the family in structuring transnational processes and the health outcomes of these processes. Levitt and Jaworsky (2007, p. 137) suggest that “family networks that cross borders are characterized by gendered differences in power and status” (p. 137). Mahler and Pessar (2001) propose the idea of gendered geographies of power to explain the way in which gender structures migration, and how migration may both change and reinforce traditional gender relationships and inequalities. Migration may lead to changes in gender hierarchies, but may also reinforce traditional, gendered divisions of labor and power as migrants encounter new social locations in the reception context while continue to operate within the gendered context of their country of origin.

Parrado and Flippen (2005) suggest that change in gender relations due to migration be viewed in the context of three domains -- labor, power, and cathexis, or the attachment of

emotional ideas or feelings to ideas, objects, or people – rather than evaluated as either a complete shift or complete stasis in gender inequality. With change potentially taking place across these three domains, it's possible to imagine that family-member migration might influence the health of some non-migrants more than others, and in different directions, based on personal conditions of labor (e.g. paid or not; public, in the home, or both), power or control over decision-making, and individual ways of defining the roles of men and women in romantic and familial relationships.

For example, if a woman is able to improve her socio-economic standing and increase control over family finances by working outside the home, there may be some beneficial effects of spousal migration on health, including health in the long run (Bojorquez et al., 2009; Caballero et al., 2008). Working outside the home may afford women more control over earned income, or may facilitate the development of social networks outside the home that may help buffer the effects of stressful life events on health (Parrado, Flippen, & McQuiston, 2005). On the other hand, the social and economic gender hierarchies that existed pre-migration may become reinforced and may be made even more rigid as families are spread across borders if women who stay behind are prevented from gaining more egalitarian footing through entry into paid labor force or further dependency on their spouse's increased earnings, sent home in the form of remittances (McKenzie & Menjivar, 2011). In addition, even women who gain employment outside the home as the result of migration likely have a double burden of formal employment and childcare (Caballero et al., 2008). Finally, women employed as domestic workers may face a dual burden of reproductive labor in the home and in the work day, in addition to being faced directly with class hierarchies that allow for the outsourcing of domestic work from wealthier to poorer women, which may be associated with a decreased sense of

personal control or other psychological coping resources to mitigate the health effects of job strain, family strain, and other stressful life events (Salazar Parrenas, 2000).

I hypothesize that on balance spouses' U.S. migration will be associated with higher probabilities of diabetes, hypertension, and more past-week depressive symptoms for middle-aged and older Mexican women, compared to those whose spouses never migrated. Given the theoretical framework related to gender and power in migration outcomes, I hypothesize that the adverse effect of spouses' U.S. migration history on chronic disease and depression outcomes for middle-aged and older Mexican women will be explained in part by also having a history of raising children on their own. I additionally expect that the association between spousal migration to the U.S. on later-life health will be conditional on occupational histories of unpaid work or domestic work outside the home. For middle-aged and older Mexican women, the adverse effect of spouses' migration history on chronic disease and depression outcomes may be buffered by a history of getting paid for their own labor, and by work in higher-status occupations (e.g. service, professional) for pay.

With reference to the dimension of power or decision-making raised (Parrado et al., 2005), I also expect that the effect of spouses' migration history on chronic health conditions will be exacerbated for respondents with lower self-assessed decision-making power relative to their spouses. Alternately, the adverse effect of spouses' migration history on chronic health conditions will be buffered or diminished for higher self-assessed decision-making power relative to their spouses. High perceived control or decision-making power can additionally be thought of as a psychological resource that may buffer the deleterious health effects of stress, including family and job strain (Gallo, Espinosa de los Monteros, Ferent, Urbina, & Talavera,

2007; Pudrovska, Schieman, Pearlin, & Nguyen, 2005).<sup>3</sup> Finally, I expect that women's own mobility within Mexico might moderate the relationship between spousal migration and later-life health outcomes, with women's own migration (primarily internally within Mexico), acting as a buffer between spousal migration and worse later-life health; while spousal migration decisions may be out of their control (Hondagneu-Sotelo, 1994), it may be that in some cases women's own migration reflects greater decision-making power at least when it comes to matters of family and migration.

## ***METHODS***

### ***Data and Methods***

Data for this analysis comes from the 2001 Mexican Health and Aging Study (MHAS), a nationally representative panel survey of adults living in Mexico who were born before 1951 (MHAS, 2001). The objective of the MHAS was in part to understand the role of migration, including family member migration, on the health and aging indicators of middle-aged and older Mexican adults. The MHAS includes extensive measures on health and health services, family composition, caregiving and monetary transfers, as well as personal and family migration history (R Wong, Pelaez, Palloni, & Markides, 2006).

The MHAS selected households with adults 50 years and older that were previously included in the nationally representative 2000 Mexican Employment Survey (ENE-2000) (R. Wong & Espinoza, 2004). Based on the pool of potential respondents, the MHAS used a multistage area probability sample, stratifying by two Mexican regions consisting of: 1) six states with high rates of out-migration to the United States and 2) the remaining 26 states and the

---

<sup>3</sup> There are no measures available in my dataset that would allow for conditioning the effects of spousal migration on later-life chronic disease and depression outcomes on individual respondents' ideas or meanings attached to gender roles – the third domain raised by Parrado and Flippen (2005).

Federal District of Mexico. Households in heavy out-migration states (Durango, Guanajuato, Jalisco, Michoacán, Nayarit and Zacatecas) were oversampled relative to households in the remaining states<sup>4</sup>. Specifically, the quota of households set for the six high out-migration states represented 27% of the intended sample (or 3,000 households for a total target of 11,000 households) whereas 73% of households (5,000) were to be surveyed in the remaining states.

At the household level, each adult 50 years or older had an equal probability of being selected, proportionate to the number of age-eligible adults in the household. Spouses or cohabitating partners were also interviewed regardless of age. Proxy interviews were completed for respondents who could not answer directly due to severe health problems, cognitive impairment, and language difficulties (e.g. non-Spanish speakers), or prolonged (but temporary) absences. Next-of-kin interview were conducted on subjects who had died by the follow-up visit.

The MHAS had a baseline response rate of 89.7% and collected data from a total of 15,156 respondents, spouses and proxy respondents. I am excluding 1032 proxy respondents from my analytic sample given their limited responses on key measures in my models (i.e. childhood conditions, depressive symptoms).<sup>5</sup> I will also exclude 1669 spouses that were

---

<sup>4</sup> Based on out-migration data from 1995. Guanajuato, Jalisco, and Michoacán were the most prominent sending regions throughout 20<sup>th</sup> Century U.S.-Mexico migration history, although the remaining three states are also considered part of the ‘historic sending region’ of Western Mexico (Durand et al., 2001).

<sup>5</sup> The exclusion of proxy interviews may bias the sample towards healthier individuals with more education, given that health and language difficulties were primary reasons for interviewing a proxy. In addition, while long-term care facilities are rare in Mexico relative to the US, a growing number of older adults make use of these facilities and would not be represented in this study (R Wong et al., 2006). This may skew the MHAS sample towards younger adults with better physical, mental and cognitive health indicators. On the other hand, Wong and Espinoza (2004) compared baseline sample characteristics for the MHAS to responses to other household surveys (National Health Survey, the National Income and Expenditures Survey, and the National Employment Survey, all fielded in 2000) and the 2000 Mexican Census to test the validity of the sample. They found that MHAS respondents were comparable to respondents to the Census and other national surveys on distributions of age, gender, educational, marital status,

younger than 50 years old at baseline. After excluding proxy respondent interviews and non age-eligible spouses, the baseline sample includes 12,455 age-eligible direct respondents and spouses. Of the baseline sample, my analytic sample includes 6253 women with some marital history and with non-missing information related to spousal migration to the US.

### Dependent Variables

The outcome measures for my dissertation include self-report measures of doctor-diagnosed diabetes and hypertension, respectively. Specifically, respondents were asked, “has a doctor or medical personnel ever told you that you have diabetes or a high blood sugar level?” and “has a doctor or medical personnel ever told you that have hypertension or high blood pressure?” Respondents answered either ‘yes’ or ‘no’, although a total of 120 respondents from my analytic sample reported never visiting a doctor or medical personnel as of 2001. Another 133 were missing data on hypertension and diabetes.

The third dependent variable is a measure of past-week depressive symptoms using an adapted, 9-item version of the Centers for Epidemiological Studies – Depression (CES-D) scale. Versions of the CES-D scale, including the 9-item version used in the MHAS, have been validated for use among older adult populations in Mexico (Aguilar-Navarro, Fuentes-Cantú, Ávila-Funes, & García-Mayo, 2007; Sánchez-García et al., 2008). For the scale, respondents were asked to indicate if for the majority of the past week they felt the following: depressed, lonely, sad, tired, that everything they did was an effort, or that their sleep was restless. An additional three positively worded items were included: whether respondents felt happy, enjoyed

---

literacy and number of children. Distributions of responses on average height, body mass index, self-rated health, doctor-diagnosed diabetes, hypertension, and current smoking and alcohol use were comparable between MHAS respondents and respondents 50 years and older to the National Health Survey.

life, or felt they had a lot of energy. Each item originally had a response code of 1 for a “yes” and 0 for a “no” answer. The three positively worded items were reverse coded and all of the items were summed such that higher scores indicated more depression-related feelings. The scale has a reliability coefficient of  $\alpha = 0.80$  for this sample.

In addition to the continuous measure of past-week depressive symptoms, I will test a binary measure of five or more past-week depressive symptoms as a proxy for clinical depression. This cut-off point was suggested based on the validation study by Aguilar-Navarro and co-authors, (2007), based on their validation study with a sample of geriatric clinical patients in Mexico City. After comparing scores on the 9-item CES-D scale to clinician diagnoses of major depressive disorder using the criteria from the Diagnostic and Statistical Manual, Fourth Edition (DSM-IV), the authors found that a cut-off of five points maximizes both the sensitivity—the ability of the CES-D to suggest clinical depression given a positive clinical diagnosis using the DSM-IV, and specificity—or the ability of the CES-D cut-off to detect negative cases given a true negative clinical diagnosis of depressive disorder using the DSM-IV. In particular, the sensitivity estimated for the 5-point cut-off was 85.3% and the specificity was 56.7% (Aguilar-Navarro et al., 2007).

### ***Descriptive statistics***

The MHAS collected data from female respondents on whether or not their spouses ever went to live and work in the US, only if those respondents were not currently married (i.e. widowed, divorced, or separated). This means that for those women currently married, spousal migration history must be captured from their spouse’s own interviews. This creates two categories of women whose spouses migrated to the US – those who are divorced, widowed, or separated, and those currently married and living with their spouses. While the objective of this

analysis is to examine the effect of spousal migration to the US on later-life health outcomes for older women in Mexico, differences in demographic characteristics by both spousal migration history AND current marital status suggest that both factors need to be taken into account simultaneously.

Table 1 presents demographic differences by the overarching categories of spousal migration to the US, but also by sub-categories within these groups based on current marital status. At first glance, some of the differences between broad categories of whether or not spouses migrated to the US appear to be small. This is particularly true of the variables related to labor. For example, 67% of women whose spouses never migrated report ever working and 63% of those whose spouses migrated to the US report the same. Also, around 17% of both those with and without a history of spousal migration history to the US reported working in a domestic occupation. But the differences are stark when the spousal migration categories are broken apart by current marital status. About 75% of women not currently in a union report ever working in their lifetime, regardless of spousal migration history, while only 56% of those currently married whose spouses also migrated to the US. Similarly, between 22% and 25% of women not in a union at the baseline survey reported working doing domestic labor, while only 12% to 15% of those currently married reported the same.

The numbers on labor would make it seem as though the differences in this sample seem to lie more with marital status than with histories of spousal migration to the US. However, the indicator of whether or not women reported raising their children alone suggests otherwise. While women who were widowed, divorced, or separated at baseline were more likely to report raising children alone regardless of spousal migration to the US, nearly 66% of those both not in a union and reporting spousal migration history reported a period of raising children alone

compared to the 41% not in a union but with no spousal migration history. In other words, those with

In terms of current residence, it seems that who are not in a current union are also more likely to be living in urban areas compared to their married counterparts, regardless of spousal migration history. On the other hand, both married and unmarried women who report a history of spousal migration are more likely to living in one of the six historically high out-migration states oversampled as part of the baseline study. Women with a history of spousal migration are also more likely to have their own history of migration to the US (followed by return back to Mexico): 10% of women with a history of spousal migration to the US also went to the US to work or live across categories of marital status, compared with 2% of those with no spousal migration history. Rates of internal migration, on the other hand, were highest for women both currently married and with a history of spousal migration to the US (68%), and lowest for those not currently in a union and with spousal migration history (57%). Finally, those with spouses who migrated to the US – themselves more likely to have gone abroad and more likely to reside in historically high out-migration states, were more likely to have family members that have immigrated to the US to live or work.

All groups categorized by spousal migration history and marital status were similar on indicators of education, having a serious health problem before age 10, and reporting frequent hunger before age 10 – all indicators of childhood socio-economic and health conditions that may influence the selection of individual women into marriages with and without histories of migration to the US. However, about 64% of those with no spousal migration history to the US, and 74% of those with a history of spousal migration to the US reported having no sanitation facilities in their household before age 10, suggesting a context of more disadvantaged material

conditions for those in marriages that did not involve migration to the US. It may be important to control for this particular indicator of early childhood material conditions and health context, given that these early-life (and pre-marriage) conditions may also influence later-life health outcomes.

The final set of descriptive statistics in this table report on current economic and material conditions. Across categories of marital status and history of spousal migration to the US, respondents report a similar number of household items (slightly more than four, on average). They also give similar ratings of their subjective economic situation, with around 80% reporting insufficient funds to meet basic needs. There is a greater variability when it comes to reporting monthly incomes and net assets that fall in the bottom two quartiles, based on the overall baseline sample. Around 57% of respondents who are married report being in the bottom two quartiles of monthly income, whereas the figure is *lower* for those who are currently widowed, divorced, or separated (52% of those with no spousal migration history and 50% of those with spousal migration history). It may be that women in particular who are not in a union receive more monthly contributions from their children and other family members than those who are married and combine resources with their spouse. On the other hand, women who are not in a union have fewer total assets to their name compared to their counterparts in a union, regardless of spousal migration history. Well over half of respondents not in a union report being in the bottom quartiles of wealth as constructed from the overall sample, whereas 40% of those in a union report being relatively disadvantaged in terms of their total assets.

Table 2 shows descriptive statistics for the outcomes variables for my analysis. On the descriptive level, there appear to be important differences in health outcomes by both history of spousal migration to the US and current marital status – with the most adverse health outcomes

reported by those whose spouses migrated to the US *and* who are not currently married. Around 45% of women with no spousal migration history (regardless of marital status) and 48% of those whose spouses migrated to the US but are currently married reported ever being diagnosed with hypertension. This compares to the 57% of women who reported not being in a current union and spousal migration to the US that reported doctor-diagnosed hypertension. Similarly, between 17% with no spousal migration history reported ever being diagnosed with diabetes while a full quarter of those with both spousal migration *and* no current union reported a doctor diagnosis of diabetes. It should be noted, however, that women with some history of spousal migration—and those who are not currently in a union, in particular—are significantly more likely to report having had recent tests for hypertension and diabetes.

Results are a bit more varied for the measure of past-week depressive symptoms. At first glance, the trends in past-week depressive symptoms appear to be more closely related to current marital status: around 40% of those currently married report five or more past-week depressive symptoms, regardless of spousal migration to the US. Among those not currently in a union, 49% of those with no spousal migration history report symptoms consistent with past-week depression and 55% of those with spousal migration to the US report the same.

### ***Bivariate associations between spousal migration and later-life health***

Table 3 reports results from bivariate logistic regression analysis for all three-outcome variables using only the four-category measure of both spousal migration history and current marital status. The results for depression suggest that respondents not in a current union – both those who report spousal migration history and those who do not – have significantly greater odds of reporting five or more past-week depressive symptoms compared with those who are both currently married and reported no spousal migration history, which is the reference group

(OR: 1.44, 95% CI: 1.28, 1.61, for those with no spousal migration history; OR: 1.85, 95% CI: 1.47, 2.32, for those with spousal migration history). There was no significant difference in the odds of depression for those who reported spousal migration to the US *and* are currently married compared to their counterparts who are also married but have no history of spousal migration to the US. Again, it appears that the odds of depression, based on a cut-off of five or more past-week depressive symptoms, is more closely linked to current marital status than respondents' experience with spouses migration to the US, although further analyses stratified by marital status are necessary to make this conclusion; I present these results below.

For the bivariate regression analyses of doctor-diagnosed hypertension and diabetes, respectively, the only group that has significantly greater odds of reporting these conditions compared to the currently married/no spousal migration history reference category is the group that is both currently not in a union *and* reports a history of spousal migration to the US. This is reflective of the descriptive statistics, which suggest that this group of respondents who experienced spousal migration to the US and are currently divorced, separated, or widowed, are the most disadvantaged in terms of their current chronic disease outcomes.

Table 4 presents results from bivariate logistic regression analyses of the association between spousal migration and each of the dependent health outcomes, stratified by current marital status. This allows a more direct look at the association between spousal migration to the US and each of the health outcomes within groups of respondents that are currently in a union or not. The results here suggest that there are significant associations between spousal migration to

the US and each of the later-life health outcomes – depression, hypertension, and diabetes – only for those who are not currently in a union.<sup>67</sup>

These stratified analyses are more to the point in terms of limiting analyses of spousal migration history and health to specific groups that are similar in terms of current marital status, allowing me to tease apart the effects of spousal migration from the effects of current marital status. However, I often choose to use the composite measure that combines the effects of spousal migration and current marital status for many of my subsequent analyses, given the fact that stratified analyses severely limits my capacity to make comparisons across the stratified groups because of highly variant sample sizes. In some cases, including for a decomposition analysis of mediation effects, and in some analyses I use both a multivariate and a binary model of spousal migration history, stratified by current marital status.<sup>8</sup> I now turn to multivariate logistic regression models.

### ***Multivariate logistic regression models***

In Tables 5-7, I present multivariable logistic regression models for each of the three health outcomes. Given the varying results in the bivariate models based on whether or not I used the binary or the four-category measure of spousal migration, I run versions of the

---

<sup>6</sup> In multivariate analyses, I further stratify by whether or not respondents are divorced/separated versus widowed, since these are quite different phenomenon.

<sup>7</sup> For those currently in a union, I also try the regression analyses restricted to those married only once to be sure that the migrant spouse is also their current migrant spouse. The results are the same: there is no significant association between spousal migration and any of the later-life health outcomes for those currently married or in a consensual union.

<sup>8</sup> I also tested bivariate and multivariable models that consider a four-category measure of spousal migration by whether or not respondents live alone, rather than respondent marital status. It is not possible to simply including living arrangements as a control measure in a multivariable model, since no respondents who are current married live alone, which would leave cells for married respondents with zero observations. I decide not to include these models here because cell sizes run quite small in some cases (n=86 of non-married respondents reported both spousal migration and living alone), and results are therefore too tenuous to interpret with confidence.

multivariable models using each version. Overall, I find some reduction in the effect sizes and significance levels of the measure of spousal migration to the US across models. According to my theoretical model, this does not imply that spousal migration, and spousal migration for those not currently in a union specifically, is no longer important. It may be that the relationship between spousal migration history and later-life health outcomes is indirect, and mediated by factors like raising children alone or work history. I examine this mediation effect in more detail further on in the analysis, but now turn to examine the results of the multivariable models for each of the health outcomes.

### *Depression results*

It is clear that current marital status is a more important predictor of depression than spousal migration history in the multivariate model, as was evident in the bivariate models. The binary measure of spousal migration is not significantly associated with depressive symptoms.<sup>9</sup> What is interesting to note is that there are other variables related to migration that are significantly associated with the odds of depression. Living in a state with high rates of out-migration to the US is significantly associated with greater odds of past-week depression, all else equal (OR: 1.38, 95% CI: 1.22, 1.56). Personal migration, which in the case of women is primarily internal migration within Mexico, is associated with 12% greater odds of depression controlling for spousal migration and residence in a high out-migration state ( $p < 0.05$ ). Finally, raising children alone is significantly associated with greater odds of depression, all else equal (OR: 1.47, 95% CI: 1.29, 1.67). It should be noted that living in a high out migration state,

---

<sup>9</sup> I also tested the multivariable models using the binary measure of spousal migration, stratified by current marital status (in a union versus not), and found that spousal migration was not significantly associated with depression in these models, confirming the finding that marital status appears to be driving the association between the four-category measure and depression.

internal migration, and raising children alone are all more prevalent among those who report both spousal migration to the US and not currently in a union.

### *Hypertension results*

Spousal migration is no longer significantly associated with later-life hypertension after including the full set of controls, including family demographics, early childhood and adult socio-economic status. This is true for models that use both the binary and four-category measures of spousal migration. Notably, raising children alone is associated with 22% greater odds of doctor-diagnosed hypertension ( $p < 0.01$ ); raising children alone is more prevalent among those currently not in a union, but in particular for those who both report spousal migration to the US and not currently being in a union.

Among the other set of controls in the model, older age, greater numbers of reported live births, and reporting a serious health condition during childhood are each associated with greater odds of hypertension. Poorer self-rated economic situation, a subjective measure, is associated with significantly greater odds of reporting hypertension, but having more household items, a slightly more objective measure of material conditions, is also significantly associated with greater odds of hypertension. This is a somewhat contradictory finding that might reflect the strain of relative or perceived economic deprivation, even while there may be a reverse socio-gradient for some health outcomes for this group of older adults in Mexico, where better economic conditions facilitate diets or sedentary lifestyles that are risk factors for chronic disease outcomes.

### *Diabetes results*

The results for the doctor-diagnosed diabetes outcome suggest that spousal migration among those who report not currently being in a union continues to be associated with greater

odds of diabetes as was found in the bivariate models. Reporting both spousal migration and being currently widowed, divorced, or separated is associated with 36% greater odds of reporting doctor-diagnosed diabetes, all else equal ( $p < 0.05$ ), compared with the reference group of women currently married and with no spousal migration history. Unlike with the models for depression, living in a state with high rates of out-migration to the US and respondents' personal migration each appeared to be significantly associated with *lower* odds of diabetes diagnoses, all else equal. Also unlike both the models for depression and hypertension, raising children alone is not significantly associated with diabetes (and is not associated with diabetes even in a bivariate analysis, not shown). This may suggest that the pathways linking spousal migration and being currently widowed or divorced/separated from one's spouse to later-life diabetes do not operate through the stress of raising children alone, which again is most prevalent among those with both spousal migration and currently not married or in a union.

In addition to separating models by four-category and binary models, I test bivariate results by specific categories of divorce/separated versus widowed (not shown, available upon request). The results show that, when controlling for the full set of covariates, there are no significant associations between spousal migration to the US and depression for either those divorced/separated or widowed respondents. There is a significant association between spousal migration and the odds of hypertension for those who are currently widowed, and a significant association between spousal migration and the odds of diabetes for both those currently widowed and those currently divorced or separated (both,  $p < 0.05$ ).

### ***Mediation effects with a decomposition analysis***

My theoretical model emphasizes the possibility that the relationship between spousal migration to the US and later-life health outcomes is mediated by the effect of raising children

alone. The test for mediation effects in the case of logistic regression calls for an alternative approach to the comparison of reduced and full models with and without the key mediating variable to assess the impact on the coefficient and significance of the main predictor variable – in this case, spousal migration to the US. The `-khb-` function in STATA allows for the decomposition of mediation effects that account for the rescaling of variance in a latent outcome variable that occurs each time another predictor variable is added to a logistic regression model.

The limitation of the `-khb-` function is that it does not yet allow for key independent variables that are not either continuous or binary, which means that I cannot use my four-category measure of spousal migration by marital status. The alternative is to use the binary measure indicating whether or not respondents' spouses ever went to live or work in the US or not. This complicates the test of raising children alone as a potential mediator, since my demographic variables suggest that a *combination* of spousal migration history and the end of one's marriage or union are correlated with raising children alone. Women whose spouses migrated but are currently still in a union and living with them are just as likely to report raising children alone as those currently married women whose spouses never migrated. In addition, there is no significant zero-order association between spousal migration and any of the three outcomes for those currently in a union. I therefore run the mediation models using the binary measure of spousal migration, restricted to those not currently in a union.

The results suggest that there is a very small and non-significant mediating effect of raising children alone on the relationship between spousal migration and each of the three later-life health outcomes. As shown in Table 8, the estimated odds ratios and significance levels decrease only very slightly when adding the measure of raising children alone (the full model) to the reduced model that includes only the measure of spousal migration to the US with the

remaining demographic and socio-economic controls, as described in the multivariable models above.

Given the null results for the mediating effect of raising children alone, I moved on to test measures of adult socio-economic status as potential mediators of the relationship between spousal migration and greater odds of depression, hypertension, and diabetes, at least among those not currently in a union. I do not show the results here, given that I find no significant mediating effects when using any of the adult socio-economic status variables I've specified in my full multivariable model. These include type of work (domestic versus other) and other indicators of work history (ever worked, ever worked for pay, ever worked for free), number of household items, and subjective economic conditions; I test indicators of monthly income and wealth as alternative indicators of current economic status as potential mediators. The results are null for all of these measures as significant mediators on their own. While many of these measures are significantly associated with health outcomes on their own, there is little variability in the distribution of occupational and other SES measures among women who are not currently in a union.

The final measure that might explain some of the relationship between spousal migration and hypertension and diabetes, at least for those not currently married, is body mass index – an important risk factor for both hypertension and diabetes. It is possible that those with improved socio-economic status due to the fruits of migration (or spousal migration) to the US have higher body mass index on average, given their greater ability to purchase prepared and processed food products or to afford more sedentary lifestyles. The descriptive findings (Table 2) for the differences in body mass index do not fully support the idea that this measure could mediate the relationship between spousal migration and later-life hypertension and diabetes in particular,

given that there do not appear to be large differences in the relationship between migration and BMI. One of the biggest differences is actually in the percentage of each group who have missing data on BMI: nearly 40% of those currently married with a history of spousal migration to the US having missing BMI data compared to 30% of those who are currently married but have no history of spousal migration. The percentages of missing data are similar, however, for those who are not currently married or in a union, regardless of spousal migration history to the US (34%). Nevertheless, I formally test BMI as a mediator of the relationship between spousal migration and both hypertension and diabetes, also using the `-knb-` decomposition analysis function in STATA, and find no significant mediating effect of BMI on my zero-order relationship (not shown).<sup>10</sup>

### ***Interactions between spousal migration, labor and decision-making***

The final piece of my analysis of the effect of spousal migration on the later-life health of older Mexican women is to examine differences in outcomes by dimensions of labor and power. This means testing whether there is a different effect of spousal migration on later-life health by dimensions of women's work in and outside the home, as well as their ability to make decisions within their families and feel a sense of control over their lives.

---

<sup>10</sup> As might be expected, being in higher categories of BMI was in most cases significantly associated with greater odds of diabetes and hypertension in the model with full demographic and socio-economic controls. The exception was for models predicting diabetes that were either limited to those currently married or models that included this group of currently married respondents. It is also notable that those with missing BMI had significantly greater odds of hypertension and in diabetes models restricted to those not currently married compared to the reference group of underweight/normal respondents. This suggests that those with missing data may in fact have higher BMI on average, but may be reporting that they do not know their weight or height out of social desirability bias (or lack of access to knowledge about weight or height), which may present a challenge in really assessing how BMI does not explain part of the relationship between spousal migration and chronic disease outcomes (not shown).

In Tables 9-11, I show tests of interaction effects between spousal migration and lifetime work in a domestic occupation (compared to service, professional, factory, or agricultural occupations, or no work outside the home), for each of the three health outcomes.<sup>11</sup> The only significant interaction between spousal migration and domestic work is for the model predicting doctor-diagnosed diabetes, which suggests that the combination of spousal migration and domestic work as associated with significantly greater odds of doctor-diagnosed diabetes compared to those with both no spousal migration and no domestic work as their lifetime occupation, the reference group ( $p < 0.01$ ); those who reported spousal migration but did not report domestic work as their lifetime occupation did not have significantly greater odds of diabetes than the no spousal migration/no domestic labor group. Specifically, the odds of reporting doctor-diagnosed diabetes for those who report both spousal migration and domestic labor are 74% greater than the reference category of no spousal migration/no domestic labor, as derived from the following equation:

$$e^{0.51(\text{spousal migration}) - 0.09(\text{domestic}) + 0.59(\text{migration} * \text{domestic})} = e^{0.56} = 1.74$$

In Figure 1, I show the predicted marginal probabilities of doctor-diagnosed diabetes by categories of spousal migration and respondents' history of domestic labor. The results here also suggest that the combined effect of spousal migration, in this case regardless of current marital status, and a history of domestic labor is associated with greater odds of doctor-diagnosed diabetes than only spousal migration or domestic labor, respectively.

---

<sup>11</sup> I additionally test interaction terms between spousal migration and other dimensions of work history, including whether or not respondents worked at all, whether or not they worked for pay, or for free. I also consider the measures of raising children alone and the number of live births that respondents reported as potential indicators of the burden of work inside the home. There were no significant interaction effects between any of these measures and spousal migration for all three health outcomes.

I next I tested interaction effects between spousal migration and respondents' own migration, which largely took place in Mexico. While the relative temporality of spousal and respondent migration is largely unknown, it is possible that women's own migration may influence health outcomes either by increasing an individual sense of mobility and control (perhaps a complicating factor to the idea of being 'left behind' if those left are still moving themselves), or by leading to increased burden of labor in and outside the home if women are migrating away from their families of origin, away from potential sources of support. The only significant interaction effect between spousal migration and respondent's personal migration is for the model of doctor-diagnosed hypertension. Those who report spousal migration and no personal migration had 37% greater odds of reporting hypertension compared to those with neither spousal nor personal migration histories (the reference category), all else equal, while the odds of reporting doctor-diagnosed hypertension were 4% greater for those who report both spousal and personal migration compared to their counterparts with no personal or spousal migration to report:

$$e^{0.31(\text{spousal migration}) + 0.05(\text{personal migration}) - 0.33(\text{spousal*personal})} = e^{0.04} = 1.04$$

These results are depicted in Figure 2, which suggests that those who report spousal migration and a personal history of migration, primarily within Mexico, have lower odds of hypertension than those whose report spousal migration and no personal history of movement within Mexico. This suggests a slight buffering effect of women's experience of personal migration on the adverse influence of spousal migration on hypertension outcomes. This may complicate the idea of the effects of spousal migration on a uniform group of women who are 'left behind' in Mexico; many of these women are mobile themselves, either to the US and back,

or within Mexico, and this appears to an important consideration when examining the impact of spousal migration on long-term health outcomes.

The final set of interaction terms I test refer to the dimension of power as described by theories of gender and migration (Parrado & Flippen, 2005). Specifically, I test the interaction between spousal migration to the US and respondent's perceived power over family-level decision-making, and then a measure of perceived control over one's own life circumstances. The measure of power over family-level decision-making was asked only of respondents who are currently in a union, since the questions asked were about power over decision-making relative to these spouses (i.e. more, less, or the same power).<sup>12</sup> Again, the only significant interaction effect between spousal migration and whether or not respondents have any ability to make decisions about their family affairs is for the outcome of hypertension. The results are as one might expect: there is no significant association between spousal migration and the odds of

---

<sup>12</sup> As suggested by Parrado and Flippen (2005), I also test interaction terms between spousal migration and age and education differences, respectively, between female respondents and their spouses, with the idea that differences in age and education may serve as a proxy for differences in female respondents' power within the relationship, with those closer in age and education levels more likely to have equal power within their relationships. This analysis is only possible for respondents who are currently married and whose spouses also responded to the MHAS survey; respondents were not asked about spouse's age and education directly, so I capture it from their corresponding spouse's interview and create a measure that subtracts husband's age or education from the female respondents' age or education. The average difference in age for those currently married is 4.6 years and the average difference in education is 0.37 years. There are no significant interaction effects between spousal migration and either difference in spouse's age or education levels on the effect of any of the three health outcomes for those currently in a union (not shown). There is a significant main effect of differences in education on the odds of depression only, with each year of difference in education associated with 4% greater odds of depression, controlling for the full set of demographic and socio-economic measures ( $p < 0.05$ , not shown). I ran additional bivariate models to see if age and education differences between spouses predicted whether or not respondents felt they had power to make decisions within their relationships. Only the measure of educational differences was significantly associated with the odds of female respondents reporting they had no say in making family-level decisions ( $p < 0.05$ ).

hypertension for who have equal or more decision-making power relative to their spouses. However, the odds of reporting doctor-diagnosed hypertension for those with both spousal migration to the US and less family-related decision-making power relative to their spouses are 34% higher than for those whose spouses never migrated and who have some say in family matters, all else equal, as derived from the following equation:

$$e^{-0.16 - 0.01 + 0.47} = e^{0.29} = 1.34$$

Figure 3 also shows the predicted marginal probabilities for hypertension by categories of spousal migration and decision-making, confirming the finding that those who report both spousal migration and no decision-making power regarding family matters have higher odds of hypertension compared to those who report just one or the other. Again, this suggests that the combined effect of spousal migration and lack of decision-making power within families is associated with greater odds of hypertension for those currently married, even controlling for the full set of demographic and socio-economic characteristics.

### ***Discussion***

Overall, the results of this analysis suggest that the effect of spousal migration to the US on the later-life health of middle-aged and older Mexican women is heavily dependent on respondents' current marital status. For women who are currently married or in a consensual union, there are largely non-significant effects of spousal migration to the US on later-life health, with the exception of some significant interaction effects between spousal migration and factors like decision-making power within families. On the other hand, for women who are not currently in a union – divorced, separated, or widowed – a history of spousal migration to the US is associated with significantly greater odds of doctor-diagnosed diabetes and hypertension,

respectively. This result appears to be robust to a multivariable model that includes a number of controls for current and past demographic and socio-economic characteristics.

The findings of adverse effects of spousal migration to the US on diabetes and hypertension outcomes later on in the life course, at least for those currently not in a union, reflects to some degree the qualitative research on the effect of spousal migration on women ‘left behind’ in Mexico. As Dinerman (1982) observed based on her ethnographic work on the effect of migration on Mexican families in the 1970s:

“The increasingly prolonged absence of male heads of household has had a negative effect on family roles and relationships. It has caused notable strain between husbands and wives. Women comment freely on their suspicions of their absent husbands’ sexual activities and express fear that a husband will ‘take another wife’ in the United States.” (70)

In addition to concerns about the dissolution of unions, which appears to have a significant effect in its own right on later-life health, Dinerman also observed the burden that women faced in raising children on their own, stating that many women in the village she studied “commented on the difficulty of rearing adolescent sons without their husbands present to enforce discipline” (72). Although there is some ambiguity in my analysis as to the timing of raising children alone, and the gender, age, and numbers of children raised alone at any one time, my findings suggest that there are long-term effects of the experience of raising children alone, most notably on the odds of depression and hypertension.

There are some factors that complicate my overall finding that spousal migration to the US has adverse effects on later-life health for middle-aged and older Mexican women who are currently not in a union. For one, my spousal migration to the US is not significantly associated with depression. In fact, current marital status appears to be a much stronger predictor of depression than spousal migration; those not currently in a union have significantly greater odds

of depression, regardless of their spousal migration history. It may be that depression in this case reflects more immediate conditions of family life and change, as well as current socio-economic conditions. The measure of depression used in this analysis reflects only past-week symptoms, rather than chronic experiences with depression over the life-course. In this case, more recent life events like widowhood or marital dissolution, and the potential for reduced social and economic support in middle-age and older adulthood may be more important in shaping one's current emotional and mental health than past events like spousal migration to the US.<sup>13</sup>

There are also varying results for the models of diabetes and hypertension when testing a number of interaction terms related to female respondents' labor history, personal migration history, and decision-making assessments. There was a significant interaction in the effect of spousal migration and domestic labor on the odds of doctor-diagnosed diabetes, but not for the other health outcomes. In particular, reporting both spousal migration and domestic labor is significantly associated with greater odds of doctor-diagnosed diabetes, in this case for all female respondents with some history of marriage or consensual union (i.e. both currently in a union and not). This result held when testing the method of additive interaction effects, where the relative risk of doctor-diagnosed diabetes is significantly greater for those reporting both spousal migration to the US and a history of domestic work compared to those who reported neither experience.

---

<sup>13</sup> I attempted to address the question of family support to some degree with an additional analysis of spousal migration and whether or not respondents live alone, although too few respondents live alone to fully execute this analysis. I additionally attempted an analysis modeling whether or not respondents reported five or more past-week depressive symptoms at baseline and at a two-year follow-up interview in 2003, with different iterations of the measure of spousal migration by marital status (the four-category measure vs. a binary measure with models stratified by current marital status, not shown). The results reflect the cross-sectional models, with no significant association between spousal migration to the US and reporting depression at two time periods in later-life.

The relationship between male migration and women's work, particularly in informal sectors, is also reflected in ethnographic work on Mexican migration. As Dinerman (1978) notes based on her work on Mexican migration in the 1970s, "the removal of a potential source of cash inflow, at least temporarily, combined with the expenditure of cash to sponsor immigration, must be compensated. A major compensatory mechanism for many households is the market vending by an adult woman of the household." (499). This means that in some cases, paid work may be the result of spousal migration, particularly as male migrants are settling into work in the US, and also to compensate for the uncertainty of their remittance-sending (King, 2007). That said, paid work, including domestic labor, appears to be more common among women who are not currently in a union in the MHAS sample, regardless of spousal migration history.

As predicted by my conceptual model drawing on theories of gender and power in migration research, there are also significant interactions between spousal migration and decision-making power. For those currently in a union – those who responded to questions about decision-making power relative to their spouses – there is a significant interaction in the effect of spousal migration and decision-making power on the odds of later-life hypertension. Even though there are no main effects of spousal migration on any health outcome for those currently married, those who report both spousal migration and less decision-making power relative to their spouse have significantly greater odds of doctor-diagnosed hypertension compared with the reference group of respondents who report both no spousal migration and more or equal decision-making power than their husbands when it comes to family affairs.

One of the key concerns in interpreting the results of the interaction terms in particular is the ambiguous timing of events. For example, while there appears to be a significant interaction in the effect of spousal migration and family decision-making power on the odds of diabetes for

those respondents currently in a union (with greater odds of diabetes for those reporting both spousal migration and low family decision-making power), the measure of family decision-making power reflects *current* circumstances. It does not necessarily mean that women with higher or equal levels of family decision-making power relative to their spouses *during the study* had any say in whether or not their spouse migrated to the US, or other details of family life, earlier in their life. As Kaniaiapuni (1995) found in her more recent study of women's role in the process of migration in two Mexican villages, women often had very little say in whether or not their spouses were going to migrate, and decisions were often made within a few days of departure. Hondagneu-Sotelo (1994) reports similar findings of women's limited decision-making around migration itself, based on her interviews with Mexican men and women in the US, reflecting on their and their spouses' departure from Mexico. For any number of reasons, including both respondents' and male spouses' physical or cognitive functioning, female respondents' relative power over family-level decisions may have improved or eroded over time. Spousal migration itself may have shifted decision-making patterns within families, as Hondagneu-Sotelo also reports that the Mexican immigrant women she interviews suggest that their husbands' absence due to US migration required them to "act decisively and autonomously" as de facto heads of household (p. 65). Similar ambiguities about time might be applied to the interaction terms considering spousal migration and respondents personal migration, since the relative timing of each is unknown.

Another limitation of this analysis is that the variables of migration and marriage are measured at the individual level. I do not have information on community-level experiences of migration and sex ratios during respondents' earlier lives. While I know some information about their current residence (high out-migration state or not, urban residence or not), I have no way of

assessing whether this is the same context in which they lived out their marital and migration histories earlier in life. Choi and Mare (2012) emphasize the importance of considering community-level migration in models combining marriage and migration, given the fact that migration can contribute to vast changes in community marriage markets by removing marriageable single men for stretches of time. They suggest that women in these depleted marriage markets may be more likely to ‘marry down’ to men with lower education levels. It’s possible that partnering with men with lower education might lead to poorer economic outcomes for the family unit across the life-course, especially compared to women with a wider selection of marriage prospects in lower out-migration communities. On the other hand, women who have higher levels of education may also enjoy higher levels of power over decisions within their families and about their personal lives, which may diminish the adverse effects of spousal migration on health outcomes (Parrado et al., 2005). Even within Kanaiaupuni’s ethnographic study of two Mexican sending communities, there was a great amount of variability by community in the level of decision-making power that women had when it came to their spouses’ migration to the US; I am not able to take this community-level variation into account in my models.

Despite the limitations in my analysis, the overall findings support my hypothesis that spousal migration has an adverse effect on the later-life health of Mexican women, with the qualifications that these results only apply to those not currently in a union, and to models of doctor-diagnosed diabetes and hypertension. Even with these restrictions, the results speak to the importance of family migration history in shaping later-life chronic disease outcomes for older women in Mexico, in combination with their marital histories. Although the timing of spousal migration is not entirely clear, these findings point to the potentially ‘long-arm’ of spousal

migration to the US on the health of a subset of Mexican women who are currently divorced, separated, or widowed, suggesting that spousal migration history may be an important aspect of life-course influences on later-life health.

## **References**

- Aguilar-Navarro, S. M., Fuentes-Cantú, A., Ávila-Funes, J. A., & García-Mayo, E. J. (2007). Validez y confiabilidad del cuestionario del ENASEM para la depresión en adultos mayores. *Salud Pública de México*, *49*(4), 256-262.
- Aysa, M., & Massey, D. S. (2004). Wives left behind: The labor market behavior of women in migrant communities In J. Durand & D. S. Massey (Eds.), *Crossing the border: Research from the Mexican Migration Project*. New York, NY: Russell Sage Foundation.
- Bojorquez, I., Salgado de Snyder, N., & Casique, I. (2009). International migration of partner, autonomy and depressive symptoms among women from a Mexican rural area. *International Journal of Social Psychiatry*, *55*(4), 306-321. doi: 55/4/306 [pii] 10.1177/0020764008095117
- Caballero, M., Levya-Flores, R., Ochoa-Marín, S. C., Zarco, A., & Guerrero, C. (2008). Las mujeres que se quedan: migración e implicación en los procesos de búsqueda de atención de servicios de salud. *Salud Pública de México*, *50*(3), 241-250.
- Choi, K. H., & Mare, R. D. (2012). International migration and educational assortative mating in Mexico and the United States. *Demography*, *49*, 449-476.
- Creighton, M. J., Goldman, N., Teruel, G., & Rubalcava, L. (2011). Migrant networks and pathways to child obesity in Mexico. [Research Support, N.I.H., Extramural]. *Social Science and Medicine*, *72*(5), 685-693. doi: 10.1016/j.socscimed.2010.12.006
- Dinerman, I. R. (1978). Patterns of adaptation among households of U.S.-bound migrants from Michoacán, Mexico. *International Migration Review*, *12*(4), 485-501.
- Dinerman, I. R. (1982). Migrants and stay-at-homes: A comparative study of rural migration from Michoacán, Mexico. *Monograph Series*, *5*. Center for U.S.-Mexican Studies: University of California, San Diego.
- Durand, J., Massey, D. S., & Zenteno, R. M. (2001). Mexican immigration to the United States: Continuities and changes. *Latin American Research Review*, *36*(1), 107-127.
- Frank, R., & Wildsmith, E. (2005). The grass widows of Mexico: Migration and union dissolution in a binational context. *Social Forces*, *83*(3), 919-947.
- Gallo, L. C., Espinosa de los Monteros, K., Ferent, V., Urbina, J., & Talavera, G. A. (2007). Education, psychosocial resources, and metabolic syndrome variables in Latinas. *Annals of Behavioral Medicine*, *34*(1), 14-25.
- Ham-Chande, R. (2011). Diagnóstico socio-demográfico del envejecimiento en México *La Situación Demográfica de México* México, D.F. : Consejo Nacional de Población.
- Handley, M. A., Robles, M., Sanford, E., Collins, N., Seligman, H. K., Defries, T., . . . Grieshop, J. (2013). Navigating changing food environments: Transnational perspective on dietary behaviors and implications for nutritional counseling. *Global Public Health*, *8*(3), 245-257.

- Hondagneu-Sotelo, P. (1994). *Gendered transitions: Mexican experiences of immigration*. Berkeley and Los Angeles, California: University of California Press.
- Kanaiaupuni, S. M. (1995). *The role of women in the social process of migration: Household organizational strategies of Mexican families*. Department of Sociology, University of Chicago: PhD Dissertation.
- King, M. C. (2007). Even Gary Becker wouldn't call them altruists! The case of Mexican migration: A reply to Sana and Massey, SSQ June 2005. *Social Science Quarterly*, 88(3), 898-907.
- Levitt, P., & Jaworsky, N. (2007). Transnational migration studies: Past developments and future trends. *Annual Review of Sociology*, 33, 129-156.
- Mahler, S. J., & Pessar, P. R. (2001). Gendered geographies of power: analyzing gender across transnational spaces. *Identities: Global Studies in Culture and Power*, 7(4), 441-459.
- McGuire, S., & Martin, K. (2007). Fractured migrant families: paradoxes of hope and devastation. *Family and Community Health*, 30(3), 178-188.
- McKenzie, S., & Menjivar, C. (2011). The meanings of migration, remittances and gifts: views of Honduran women who stay. *Global Networks*, 11(1), 63-81.
- MHAS, M. H. a. A. S. (2001). *Data Files and Documentation (Public Use): Mexican Health and Aging Study*.
- Palloni, A. (1981). Mortality in Latin America: Emerging patterns. *Population and Development Review*, 7(4), 623-629.
- Parrado, E. A., & Flippen, C. (2005). Migration and gender among Mexican women. *American Sociological Review*, 70(4), 606-632.
- Parrado, E. A., Flippen, C., & McQuiston, C. (2005). Migration and relationship power among Mexican women. *Demography*, 42(2), 347-372.
- Pudrovska, T., Schieman, S., Pearlin, L., & Nguyen, K. (2005). The sense of mastery as a mediator and moderator in the association between economic hardship and health in late life. [Article]. *Journal of Aging and Health*, 17(5), 634-660. doi: 10.1177/0898264305279874
- Riosmena, F., Frank, R., Akresh, I. R., & Kroeger, R. A. (2012). U.S. migration, translocality, and the acceleration of the nutrition transition in Mexico. *Annals of the Association of American Geographers*, 102(5), 1209-1218.
- Salazar Parrenas, R. (2000). Migrant Filipina domestic workers and the international division of reproductive labor *Gender and Society*, 14(4), 560-580.
- Salgado de Snyder, V. N. (1993). Family life across the border: Mexican wives left behind. *Hispanic Journal of Behavioral Sciences*, 15(3), 391-401.
- Salinas, J. J. (2008). Tapping healthcare resources by older Mexicans with diabetes: how migration to the United States facilitates access. *Journal of Cross-Cultural Gerontology*, 23(3), 301-312.
- Sánchez-García, S., Juárez-Cedillo, T., García-González, J. J., Espinel-Bermúdez, C., Gallo, J. J., Wagner, F. A., . . . García-Peña, C. (2008). Usefulness of two instruments in assessing depression among elderly Mexicans in population studies and for primary care. *Salud Publica Mex*, 50(6), 447-456. doi: S0036-36342008000600005 [pii]
- Stevens, G., Dias, R. H., Thomas, K. J. A., Rivera, J. A., Carvalho, N., Barquera, S., . . . Ezzati, M. (2008). Characterizing the epidemiological transition in Mexico: National and subnational burden of diseases, injuries, and risk factors. *PLoS Medicine* 5(6), e125.

- Ullmann, S. H. (2012). The health impacts of international migration on Mexican women. *Global Public Health*, 7(9), 946-960.
- Viruell-Fuentes, E. A., & Schulz, A. J. (2009). Toward a dynamic conceptualization of social ties and context: implications for understanding immigrant and Latino health. [Research Support, N.I.H., Extramural Research Support, Non-U.S. Gov't Research Support, U.S. Gov't, Non-P.H.S.]. *American Journal of Public Health*, 99(12), 2167-2175. doi: 10.2105/AJPH.2008.158956
- Wong, R., & Espinoza, M. (2004). *Mexican Health and Aging Study (ENASEM), 2001: Methodological Document and Project Report, Version 2*. Retrieved from: [http://www.mhas.pop.upenn.edu/english/documents/Methodological/Doc\\_metodologico-v2.pdf](http://www.mhas.pop.upenn.edu/english/documents/Methodological/Doc_metodologico-v2.pdf)
- Wong, R., & Palloni, A. (2009). Aging in Mexico and Latin America. In P. Uhlenberg (Ed.), *International Handbook of Population Aging*. US: Springer Science.
- Wong, R., Pelaez, M., Palloni, A., & Markides, K. (2006). Survey data for the study of aging in Latin America and the Caribbean - Selected studies. [Article]. *Journal of Aging and Health*, 18(2), 157-179. doi: 10.1177/0898264305285655





65.5 (10.3)	66	61.1
1521 (73.1)	342 (54.6)	241 (71.7)
489 (23.5)	305 (48.6)	130 (38.7)
--	627 (100)	1 (0.3)
--	0	97 (28.9)
--	0	238 (70.8)
--	0	0
241 (11.6)	52 (8.3)	52 (15.5)
29.5 (14.6)	39.7 (10.2)	29.8 (14.3)
1568 (75.5)	352 (56.1)	255 (75.9)
1499 (72.2)	310 (49.4)	242 (72.0)
451 (22.0)	138 (22.0)	80 (23.8)
445 (21.5)	81 (12.9)	84 (25.0)
119 (5.8)	24 (3.8)	26 (7.7)
528 (25.5)	116 (18.5)	84 (25.0)
143 (6.9)	71 (11.3)	25 (7.4)
328 (15.8)	58 (9.3)	35 (10.4)
507 (24.5)	275 (43.9)	80 (23.8)
6.13 (3.60)	7.11 (3.73)	6.92 (3.53)
852 (40.9)	213 (34.1)	221 (65.8)
<b>428 (20.4)</b>		<b>86 (25.5)</b>
--	148 (23.6)	--
1302 (62.8)	427 (68.1)	190 (56.6)
64 (3.1)	57 (9.1)	43 (12.8)
773 (37.3)	196 (31.3)	103 (30.7)
412 (19.8)	287 (45.8)	145 (43.2)
1352 (65.1)	466 (74.4)	244 (72.6)
230 (11.1)	75 (11.9)	39 (11.6)
542 (30.9)	169 (31.2)	99 (34.5)
670 (32.2)	479 (76.4)	245 (72.9)
4.08 (1.79)	4.66 (1.42)	4.38 (1.65)
1692 (81.4)	511 (81.5)	273 (81.3)
1092 (52.5)	363 (57.9)	167 (49.7)
1194 (57.4)	247 (39.4)	195 (58.0)

relative to current spouses, only asked of respondents who were married or in a consensual union at the

Spouse never migrated to US, currently married (n=3211)	Spouse never migrated to US, currently widowed/divorced/separated (n=2079)	Spouse migrated to the US, currently married (n=627)	Spouse migrated to US, no spouse-respondent (n=336)
1424 (44.4)	945 (45.5)	300 (47.9)	190 (56.6)
			<b><math>\chi^2=30.3, p&lt;0.001</math></b>
2505 (78.0)	1653 (79.5)	511 (81.5)	280 (83.3)
			<b><math>\chi^2=14.9, p=0.06</math></b>
565 (17.6)	347 (16.7)	113 (18.0)	84 (25.0)
			<b><math>\chi^2=29.5, p&lt;0.001</math></b>
2276 (70.9)	1474 (70.9)	457 (72.9)	252 (75.0)
			<b><math>\chi^2=15.4, p=0.05</math></b>
1242 (39.8)	984 (48.6)	253 (41.4)	179 (54.9)
			<b><math>\chi^2=53.3, p&lt;0.001</math></b>
3.82 (2.70)	4.37 (2.74)	3.99 (2.72)	4.61 (2.80)
643 (20.0)	474 (22.8)	102 (16.3)	73 (21.7)
909 (28.3)	554 (26.7)	156 (24.9)	81 (24.1)
685 (21.3)	348 (16.7)	123 (19.6)	67 (19.9)
974 (30.3)	703 (33.8)	246 (39.2)	115 (34.2)
			<b><math>\chi^2=60.8, p&lt;0.001</math></b>
2066 (64.3)	1343 (64.6)	357 (56.9)	225 (66.9)
			<b><math>\chi^2=23.2, p&lt;0.01</math></b>
1001 (31.2)	617 (29.7)	201 (32.1)	97 (28.9)
			<b><math>\chi^2=3.66, p=0.89</math></b>

ied)

1.44	***	(1.28, 1.61)	1.05		(0.94, 1.18)	0.96		(0.83, 1.10)
1.07		(0.90, 1.28)	1.13		(0.95, 1.34)	0.99		(0.79, 1.22)
1.85	***	(1.47, 2.32)	1.51	***	(1.21, 1.89)	1.41	*	(1.09, 1.83)

etes for older Mexican women by spousal migration history and current marital status (n=6266 women with some marital history, non-

<b>Doctor-diagnosed hypertension (n=6245)</b>					<b>Doctor-diagnosed Diabetes (n=6254)</b>				
	<b>Currently in union</b>		<b>Currently widowed, divorced, separated</b>		<b>Currently in union</b>		<b>Currently widowed, divorced, separated</b>		
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	
	1.13	(0.95, 1.35)	1.45	** (1.14, 1.83)	0.97	(0.78, 1.22)	1.53	** (1.16, 2.01)	

for older Mexican women by spousal migration history, four-category

95% CI	Hypertension (n=5972)		OR	Diabetes (n=5980)	
	OR	95% CI		OR	95% CI
0.8, 1.45)	0.94	(0.82, 1.09)	0.89		(0.74, 1.07)
0.2, 1.05)	0.99	(0.83, 1.19)	1.01		(0.80, 1.27)
0.9, 1.86)	1.22	(0.95, 1.58)	1.36	*	(1.01, 1.84)
0.0, 1.02)	1.01	*** (1.01, 1.02)	1.00		(0.99, 1.01)
0.3, 1.07)	1.02	(0.89, 1.15)	1.24	**	(1.06, 1.46)
0.2, 1.56)	1.03	(0.92, 1.16)	0.75	**	(0.65, 0.88)
0.0, 1.26)	1.01	(0.91, 1.13)	0.87	*	(0.76, 0.99)
0.9, 1.03)	1.02	* (1.01, 1.04)	1.05	***	(1.03, 1.07)
0.9, 1.67)	1.22	** (1.08, 1.39)	1.01		(0.86, 1.19)
0.0, 1.01)	1.00	(0.99, 1.01)	0.99		(0.99, 1.01)
0.9, 1.29)	0.94	(0.83, 1.07)	1.20	*	(1.02, 1.41)
0.6, 1.37)	1.09	* (0.97, 1.23)	1.04		(0.89, 1.21)
0.6, 1.91)	1.22	* (1.03, 1.43)	1.26	*	(1.04, 1.54)
0.7, 1.42)	1.08	(0.94, 1.24)	1.01		(0.85, 1.20)
0.9, 0.96)	1.03	(0.99, 1.07)	1.01		(0.97, 1.06)
0.2, 2.72)	1.24	** (1.08, 1.42)	1.35	**	(1.13, 1.62)
	<b>96.8</b>	<b>***</b>	<b>83.84</b>	<b>***</b>	

**Mexican women by spousal migration history, for women currently widowed, divorced, or separated.**

		<b>Hypertension</b>			<b>Diabetes</b>		
% CI	OR		95% CI	OR		95% CI	
.82)	1.38	*	(1.08, 1.77)	1.58	**	(1.19, 2.10)	

Controlling for age, residence characteristics, personal migration history, family demographics (marital status, total number of years raised children alone), and childhood and adult SES characteristics.

**For Mexican women by spousal migration history for women currently not in a**

<b>Depression (n=5989)</b>		<b>Hypertension (n=5972)</b>			<b>Diabetes (n=2244)</b>		
OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
1.38	(0.99, 1.64)	1.38	** (1.08, 1.77)	1.58	** (1.19, 2.10)	1.58	** (1.19, 2.10)
1.39	(0.90, 1.50)	1.39	* (1.08, 1.78)	1.58	** (1.19, 2.11)	1.58	** (1.19, 2.11)
0.99	(1.04, 1.16)	0.99	(0.95, 1.04)	0.99	(0.94, 1.06)	0.99	(0.94, 1.06)

Controlling for age, residence characteristics, personal migration history, family demographics (marital status, total number of years raised children alone), and childhood and adult SES characteristics.

OR	95% CI	OR	95% CI	OR	95% CI
1.05	(0.86, 1.29)	1.34	(0.99, 1.82)	0.96	(0.73, 1.25)
0.91	(0.76, 1.10)				
1.81	** (1.18, 2.79)				
		0.89	(0.77, 1.03)		
		0.83	(0.57, 1.19)		
				1.15	(0.92, 1.42)
				1.06	(0.63, 1.77)

a. controlling for age, residence characteristics, current marital status, migration history, time characteristics; b. only for respondents that are currently married.

**spousal migration history with interactions by labor history, personal migration history, and**

<b>Domestic Occupation</b> (n=5972)		<b>Respondent Migration</b> (n=5972)		<b>Decision-Making Power</b> (n=3710)	
OR	95% CI	OR	95% CI	OR	95% CI
1.10	(0.94, 1.29)	1.37	* (1.06, 1.77)	0.85	(0.69, 1.05)
1.09	(0.94, 1.27)				
0.93	(0.64, 1.36)				
		1.06	(0.94, 1.19)		
		0.72	* (0.53, 0.98)		
				0.99	(0.83, 1.18)
				1.60	* (1.05, 2.44)

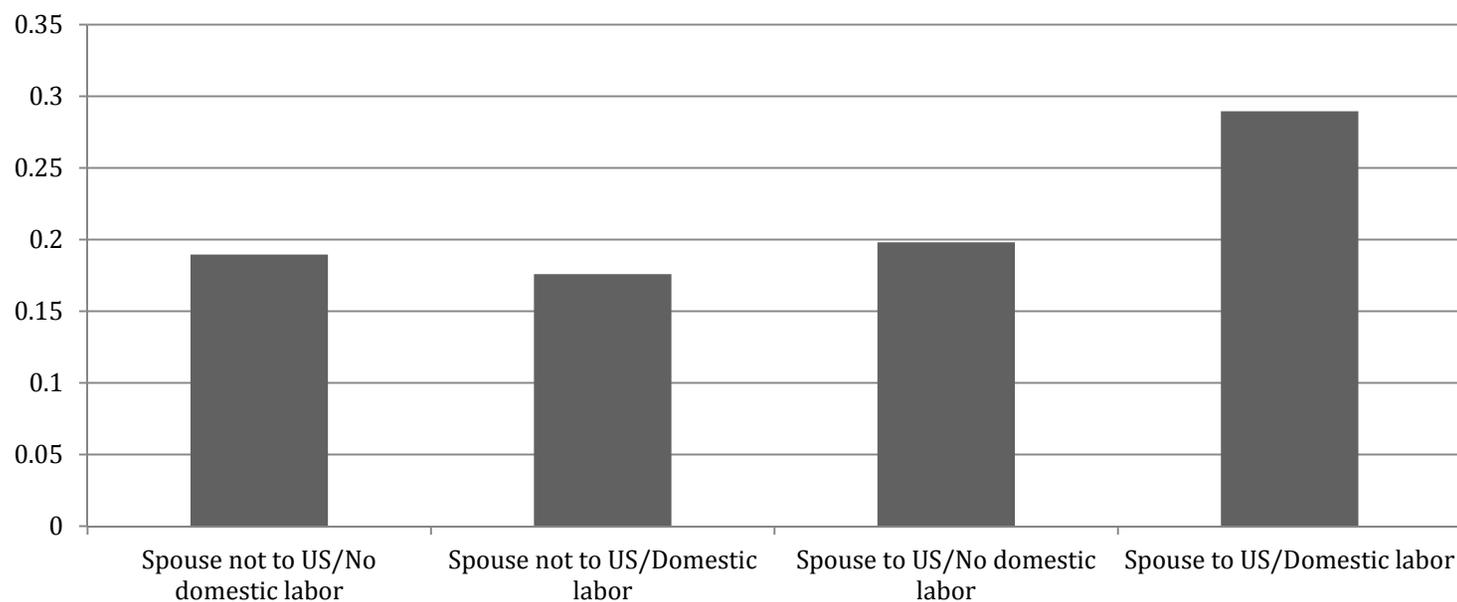
a. controlling for age, residence characteristics, current marital status, migration history, time characteristics; b. only for respondents that are currently married.

**spousal migration history with interactions by labor history, personal migration history, and**

<b>Domestic Occupation</b> (n=5989)		<b>Respondent Migration</b> (n=5989)		<b>Decision-Making Power</b> (n=3723)	
OR	95% CI	OR	95% CI	OR	95% CI
0.99	(0.84, 1.18)	0.97	(0.74, 1.26)	0.85	(0.69, 1.06)
1.28	** (1.10, 1.50)				
0.80	(0.54, 1.17)				
		1.12	(0.99, 1.27)		
		0.98	(0.72, 1.35)		
				1.06	(0.88, 1.27)
				1.17	(0.76, 1.80)

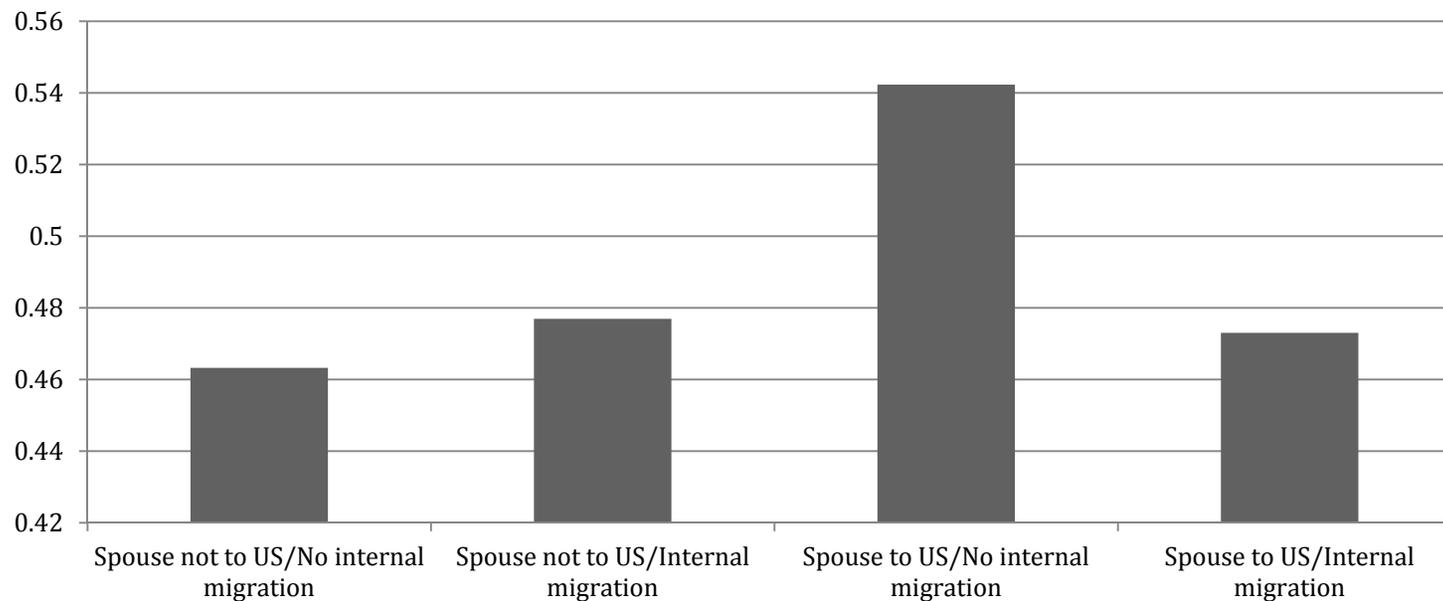
a. controlling for age, residence characteristics, current marital status, migration history, time characteristics; b. only for respondents that are currently married.

**Fig 1. Predicted marginal probabilities of doctor-diagnosed diabetes by spousal migration and respondents' history of domestic labor (n=5980)**



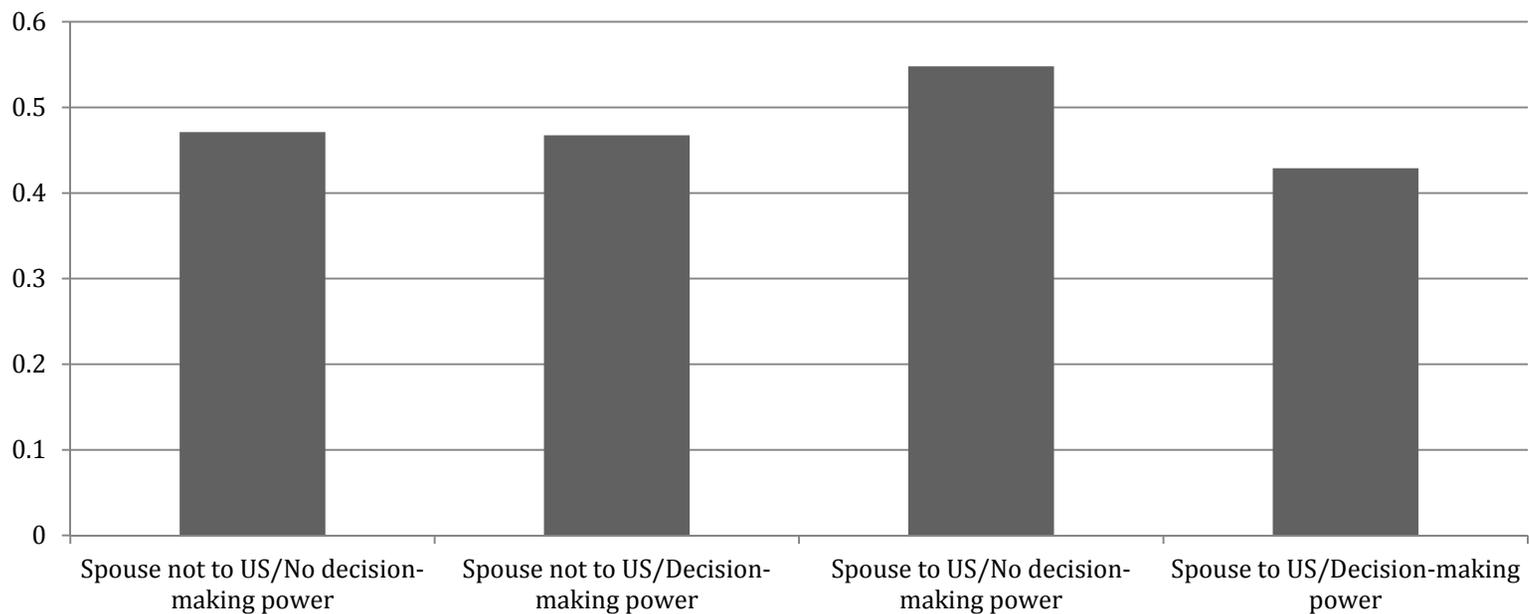
Source: Mexican Health and Aging Study, 2001 Note: Controlling for age, residence characteristics, current marital status, migration history, time married, number of live births, raising children alone, and childhood and adult socio-economic characteristi

**Fig 2. Predicted marginal probabilities of doctor-diagnosed hypertension by spousal migration and respondents' own history of migration (n=5972)**



Source: Mexican Health and Aging Study, 2001 Note: Controlling for age, residence characteristics, current marital status, time married, number of live births, raising children alone, and childhood and adult socio-economic characteristics.

**Fig 3. Predicted marginal probabilities of doctor-diagnosed hypertension by spousal migration and respondent's ability to make family-related decisions (n=3702)**



**Source: Mexican Health and Aging Study, 2001 Note: Controlling for age, residence characteristics, current marital status, migration history, time married, number of live births, raising children alone, and childhood and adult socio-economic characteristics**